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**BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES**

Application Number: 09/939,895

Filing Date: August 27, 2001

Appellant(s): AGNELLO ET AL.

Jack P. Friedman
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 11/29/06 appealing from the Office action mailed 06/04/03.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

4,908,331 RAAIJMAKERS

3-1990

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 27, 33 – 34 and 39 – 44 rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Raaijmakers (PN 4,908,331).

Raaijmakers discloses, as shown in Figure 2 and Col. 3, line 47 – Col. 4, line 50, a structure comprising a layer of cobalt disilicide (10) and a layer of silicon (1,3), wherein the layer of cobalt disilicide is on the layer of silicon, wherein the layer of cobalt disilicide is substantially free of cobalt monosilicide. In the absence of evidence to the contrary it is held that there is no oxide of titanium on the layer of cobalt disilicide. Therefore, there won't be any stringer of an oxide of titanium on the layer of cobalt disilicide.

The terms “the layer of cobalt disilicide is in contact with a reagent comprising water, ammonium hydroxide, and hydrogen peroxide”, “not adapted to chemically react”, “4 percent of a total reagent volume of the reagent” and temperature with a range of about 45 degrees Celsius to about 95 degrees Celsius” are method recitations in a device claimed. “[E]ven though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process.” *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985). Also note that at the final structure, as shown in Figures 10 and 18 of the present invention, there is no reagent in contact with the cobalt disilicide. Therefore the limitation of reagent is really recited in the intermediate step of forming the cobalt disilicide.

Regarding claim 32, Raaijmakers discloses, as shown in Figure 2 and Col. 3, line 47 – Col. 4, line 50, a structure having a substrate (11), wherein the substrate includes:

an insulated-gate field effect transistor (FET), wherein the FET includes a source (3), a drain (4), and a gate (6);

a first layer of cobalt disilicide (10) on the source, the first layer having substantially no cobalt monosilicide;

a second layer of cobalt disilicide (10) on the drain, the second layer having substantially no cobalt monosilicide;

a third layer of cobalt disilicide (10) on the gate, the third layer having substantially no cobalt monosilicide. In the absence of evidence to the contrary it is held that there is no oxide of titanium on the layer of cobalt disilicide. Therefore, there won't be any stringer of an oxide of titanium on the first, second and third layers of cobalt disilicide.

The terms "the first layer of cobalt disilicide, the second layer of cobalt disilicide, and the third layer of cobalt disilicide are each in contact with a reagent comprising water, ammonium hydroxide, and hydrogen peroxide", "not adapted to chemically react", "4 percent of a total reagent volume of the reagent" and temperature with a range of about 45 degrees Celsius to about 95 degrees Celsius" are method recitations in a device claimed. "[E]ven though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985). Also note that at the final structure, as shown in Figures 10 and 18 of the present invention, there is no reagent in contact with the cobalt disilicide. Therefore the limitation of reagent is really recited in the intermediate step of forming the cobalt disilicide.

Regarding claim 33, Raaijmakers discloses the structure further comprising,
a first insulating structure (8) bordering a side of the source (3) and bordering a side of
the first layer of cobalt disilicide (10); and

a second insulating structure (8) bordering a side of the drain (4) and bordering a side of the second layer of cobalt disilicide (10).

(10) Response to Argument

Appellants argue that the limitations of “the layer of cobalt disilicide is in contact with a reagent comprising water, ammonium hydroxide, and hydrogen peroxide” (claim 27) and “the first layer of cobalt disilicide, the second layer of cobalt disilicide, and the third layer of cobalt disilicide are each in contact with a reagent comprising water, ammonium hydroxide, and hydrogen peroxide” (claim 34) are a structural limitation and not a product by process limitation. This argument is not convincing because at the final structure, as shown in Figures 10 and 18 of the present invention, there is no reagent in contact with the cobalt disilicide. Therefore, the limitation of “the layer of cobalt disilicide is in contact with a reagent” is really recited in the intermediate step of forming the cobalt disilicide. As the result, the term “the layer of cobalt disilicide is in contact with a reagent comprising water, ammonium hydroxide, and hydrogen peroxide” is method recitation in a device claimed. “[E]ven though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process.” *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985).

Appellants argue that since Raaijmakers does not teach the method of using of a titanium nitride (TiN) capping layer to protect the cobalt from oxidizing during a subsequent annealing step to form the cobalt disilicide and the method of removing a stringer of an oxide of titanium that is generated on the cobalt disilicide, therefore, Raaijmakers does not disclose the limitation of “there is essentially no stringer of an oxide of titanium on the layer of cobalt disilicide”. This argument is not convincing because there are many techniques that can be used to form the cobalt disilicide. Thus, even though Raaijmakers does not mention about stringer of an oxide of titanium, in the absence of evidence to the contrary, the skilled artisan would expect there is essentially no stringer of an oxide of titanium on the layer of cobalt disilicide.

Appellants argue that the limitation of “wherein the reagent is not adapted to chemically react with the layer of cobalt disilicide” and “wherein the reagent is not adapted to chemically react with the first layer of cobalt disilicide, wherein the reagent is not adapted to chemically react with the second layer of cobalt disilicide, and wherein the reagent is not adapted to chemically react with the third layer of cobalt disilicide” is not a product by process because it recites a property of the reagent. This argument is not convincing for the same reason as stated above since, at the final structure, as shown in Figures 10 and 18 of the present invention, there is no reagent in contact with the cobalt disilicide.

Appellants argue that the limitation of “wherein the ammonium hydroxide comprises approximately 4 percent of a total reagent volume of the reagent, and wherein the hydrogen peroxide comprises approximately 4 percent of the total reagent volume” is not a product by

process. This argument is not convincing for the same reason as stated above since, at the final structure, as shown in Figures 10 and 18 of the present invention, there is no reagent in contact with the cobalt disilicide.

Appellants argue that the limitation of "wherein the reagent is at a temperature within a range of about 45 degrees celsius to about 95 degrees celsius" is not a product by process. This argument is not convincing for the same reason as stated above since, at the final structure, as shown in Figures 10 and 18 of the present invention, there is no reagent in contact with the cobalt disilicide.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

Hung Vu

Hung Vu

Conferees:

Richard Elms

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Hung Vu